



South Carolina Department of Health
and Environmental Control

Regulation 61-107.15

SWM: Land Application of Solid Waste

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**Bureau of Land & Waste Management
Division of Mining & Solid Waste Management
2600 Bull Street
Columbia, SC 29201**

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DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL
CHAPTER 61

Statutory Authority: 1976 Code Sections 44-96-260,
44-96-290, 44-96-310, 44-96-380, and 44-96-450.

R.61-107.15. Solid Waste Management: Land Application of Solid Waste.

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A. Applicability.

1. The purpose of this regulation is to establish appropriate application rates, frequency of application, and monitoring requirements for the uniform surface spreading or mechanical incorporation of non-hazardous solid waste on, or into, soil that is being used for agricultural, silvicultural and horticultural production. This regulation also applies to the application of solid waste on land that is being reclaimed to enhance its aesthetic value or to reduce environmental degradation. The land application of non-hazardous solid waste shall be for beneficial agricultural, silvicultural and horticultural purposes and not used as a means of disposal.

2. This regulation does not apply to the land application of solid or dissolved material in domestic sewage, industrial sludges, or water treatment sludges.

3. The application of commercial fertilizer, as defined in the South Carolina Fertilizer Law of 1954, S. C. Code Section 46-25-20 et seq. and animal manure during normal agricultural, silvicultural and horticultural operations is exempt from the requirements of this regulation.

4. Refuse, as defined and regulated pursuant to the South Carolina Mining Act, S.C. Code Section 48-20-10 et seq., including processed mineral waste which will not have a significant adverse impact on the environment, is exempt from the requirements of this regulation.

5. This regulation does not apply to the remediation of petroleum contaminated soils.

6. This regulation does not apply to the land application of hazardous waste which must be in compliance with the South Carolina Hazardous Waste Management Regulations.

7. This regulation does not apply to solid waste contaminated with petroleum products, heavy metals, septage, or pesticides regulated by the "Federal Insecticide, Fungicide, Rodenticide Act".

8. This regulation does not apply to the beneficial reuse of solid wastes in processes other than land application, e.g., the addition of ash to concrete and use of solid waste for structural fill.

9. This regulation does not apply to wastes generated as a result of ongoing normal agricultural, silvicultural, and horticultural operations when application is on properties owned and/or operated by the generator.

10. This regulation does not apply to waste generated by a homeowner when the waste is land applied on the site where it is generated.

B. Definitions.

1. "Agricultural Laboratory" means a laboratory that performs a standard agricultural soil test, such as that performed by the Clemson Soil Test Laboratory for the purpose of recommending lime and plant nutrients needed or appropriate for good crop or forest production purposes based on Best Management Practices.

2. "Agricultural land" means any land managed for the production of food, animal feed, or fiber crops, including timber and wood products.

3. "Agronomic rate, silvicultural rate, and horticultural rate" is that application rate of solid waste which supplies the amount of one or more plant nutrients needed for good crop and forest growth or which will neutralize excess soil acidity; but the nutrient requirement is not exceeded to the extent that groundwater exceeds applicable South Carolina groundwater quality standards.

4. "Bark" means the outer covering of the woody stems, branches, roots, and the main trunks of trees and other woody plants.

5. "Certified Laboratory" means a laboratory that has been certified by the State Environmental Laboratory Certification Program to perform specific analyses. All analyses required by this Regulation to be performed by a Certified Laboratory must be done by the methodology outlined in the most current issue of the EPA Publication SW-846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods".

6. "Class I Solid Waste," for the purposes of this regulation, means those solid wastes which have the potential to add some nutrient and/or pH adjustment benefit to the soil and require permitting by the Department prior to land application of that waste, e.g., wood ash, coal ash, green liquor dregs, and slaker grit.

7. "Class II Solid Waste," for the purposes of this regulation, means those solid wastes which, due to lack of substantiating data needed to calculate agronomic rate or to document that the material is non-toxic to plants and wildlife normally associated with the crop ecosystem, require issuance of a Department Research, Development, and Demonstration Permit pursuant to R.61-107.10.

8. "Class III Solid Waste," for the purposes of this regulation, means those solid wastes which have less potential to add nutrients to the soil or correct soil acidity than Class I wastes, and are considered to be innocuous with regard to effects on soil, plants and water resources when applied at approved rates. Prior to application, registration by the Department in lieu of permitting is required for Class III wastes, e.g., cotton mote waste, cotton gin trash, bark, woodyard waste, flume grit.

9. "Class IV Solid Waste," for the purposes of this regulation, means those solid wastes used for land reclamation and other projects when the application rate exceeds ten (10) dry tons per acre per year and scientific/technical data is submitted to ensure the proposed application rate will have no detrimental impact on the environment and public health, and is non-toxic to plants and wildlife normally associated with the crop ecosystem. Class IV solid wastes require permitting by the Department prior to application.

10. "Coal ash" means the residue remaining after combustion of coal and includes bottom ash, fly ash, boiler slag and flue gas desulfurization ("FGD") products.

11. "Commercial fertilizer," as defined in the South Carolina Fertilizer Law of 1954, S.C. Code Section 46-25-20, means any substance containing one or more recognized plant nutrients which are used for plant nutrient content and designed for use or claimed to have value in promoting plant growth, except unmanipulated animal and vegetable manures, marl, lime, limestone, and wood ashes.

12. "Cotton gin trash" means the residual material left as a result of ginning and cleaning cotton; it includes burs, stems, leaves, weed seed, waste cotton fiber, other plant material, and soil.

13. "Cotton mote waste" means the residual material remaining after processing of cotton mote and residue from cotton carding operations; it includes immature cotton fiber and many of the same materials found in cotton gin trash.

14. "Cumulative metal loading rate" means the maximum amount of an element which can be applied to an area of land.

15. "Department" means the South Carolina Department of Health and Environmental Control.

16. "Flume grit" means a mixture of tree bark, sand, soil, small twigs and leaves, and other debris that settles out of water used in a woodyard log flume.

17. "Generator" means any person who produces solid waste that is land applied.

18. "Green liquor dregs" means residues from the paper pulp-making process removed by sedimentation from green liquor clarification. The material is predominantly insoluble carbonates, oxides and sulfates of calcium, magnesium, aluminum and silicon.

19. "Horticultural" means land used for production of flowers, shrubs, fruits and ornamentals.

20. "Inorganic constituent" is one of the ninety-two (92) naturally occurring chemical elements or combination of those elements; generally, this excludes constituents which consist of carbon compounds other than carbonates.

21. "Land application" means the spreading of non-hazardous solid waste on the land surface and/or the mechanical incorporation of non-hazardous solid waste into the soil at agronomic or silvicultural rates.

22. "Land Reclamation" means the restoration of land for useful purposes and protection of the natural resources of the surrounding area by establishing on a continuous basis the vegetative cover, soil stability, water conditions, and the safety conditions of the area.

23. "Lime" means calcium carbonate or other calcium and magnesium compounds or mixtures which are alkaline in nature and used to neutralize excess soil acidity.

24. "Metal," for purposes of these regulation, means any of the eight (8) naturally occurring elements as listed in Section C.13., and which include arsenic, cadmium, copper, lead, mercury, nickel, selenium, and zinc.

25. "Open dumping" means any unpermitted solid waste disposal activity.
26. "Pasture" means land used for grazing livestock or forage crop production.
27. "Permit" means the process by which the Department can ensure cognizance of, as well as control over, the management of solid wastes.
28. "Person" means an individual, corporation, company, association, partnership, unit of local government, state agency, federal agency, or other legal entity.
29. "Representative sample and representative analysis," for the purposes of this regulation, mean that the chemical analyses of at least three samples (each sample being a composite of several subsamples) shall be used to calculate the amount of waste to be applied to a specific area for crop production purposes with a tolerance of 25%, unless otherwise approved by the Department. That tolerance applies to whichever constituent or characteristic, such as alkalinity, metal concentration, or nitrogen content, that limits or establishes the application rate.
30. "Silvicultural" means land used for growing trees, i.e., forestry.
31. "Slaker grit" means the unburned residues and particulate, predominantly carbonates, oxides and sulfates of calcium, magnesium and sodium removed from the causticizing process that recycles green liquor to white liquor for making paper pulp.
32. "Solid waste", for the purposes of this regulation, means any garbage, refuse, or other discarded material from industrial, commercial, mining, agricultural, silvicultural, and horticultural operations and from community activities. This term does not include solid or dissolved material in domestic sewage, recovered materials, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to NPDES permits under the Federal Water Pollution Control Act, as amended, or the Pollution Control Act of South Carolina, as amended, or source, special nuclear, or by-product material as defined by the Atomic Energy Act of 1954 42 USCA 2011 et seq. Also excluded from this definition are application of fertilizer and animal manure during normal agricultural, silvicultural, and horticultural operations, or refuse as defined and regulated pursuant to the South Carolina Mining Act, S.C. Code Section 48-20-10, et seq., including processed mineral waste, which will not have a significant adverse impact on the environment.
33. "Soluble salts" means the amount of chemical constituents in non-hazardous solid waste which are readily soluble in water as estimated by electrical conductivity.
34. "Surface water body", for the purposes of this regulation, means any body of water on the land's surface which holds visible water for greater than six (6) consecutive months, excluding drainage ditches, sedimentation ponds and other man-made operational features on the site.
35. "Total alkalinity" means a measure of the ability of a substance to neutralize acidity and is expressed as the calcium carbonate equivalent.
36. "Wood ash" means the residue derived from the combustion of wood, wood waste, bark or other plant tissue or products, including both bottom ash, fly ash and their mixtures.
37. "Woodyard wastes" means non-contaminated residues from woodyard operations, which may include bark, portions of tree limbs and logs, sand or soil, sawdust and wood chips.

C. General Provisions. The land application of all solid wastes, i.e., Classes I, II, III & IV shall be in accordance with the requirements established in this section unless otherwise stated.

1. Open dumping of solid waste is prohibited. Land application shall only be approved on land being managed for agricultural, silvicultural, or horticultural production and land reclamation projects.

2. Solid waste shall not be land applied except in accordance with the requirements established in this regulation.

3. The Department may impose more stringent requirements based on scientific and/or technical data than those established in this regulation or may issue variances on a case-by-case or site-specific basis when necessary to protect human health and/or the environment from unintended consequences associated with site characteristics or unusual characteristics of a specific solid waste.

4. The land application of solid waste shall adhere to all Federal, State and local zoning, land use and other applicable ordinances, regulations and laws.

5. If at any time the Department obtains quantitative data indicating that land application of solid waste poses an actual or potential threat to public health or the environment, or to threatened or endangered species, upon notification by the Department, the generator, applicator, and landowner shall cease activities, evaluate the extent of the problem, and implement a corrective action program approved by the Department.

6. All vehicles used to transport solid waste for the purpose of land application shall be constructed and maintained so as to minimize dropping, sifting, blowing or other escapement of solid waste from the vehicle and shall be maintained and operated in accordance with all local, State, and Federal regulations.

7. Solid waste shall not be applied to flooded, ponded, frozen or snow-covered grounds.

8. Unless part of a normal or ongoing agricultural, silvicultural or horticultural operation, exempted by 33 USC 1345 of the Clean Water Act, land application of solid waste shall be in compliance with the U.S. Army Corps of Engineers and the U.S. Environmental Protection Agency requirements concerning wetlands.

9. For all wastes with the exception of Class III (i.e., cotton gin trash, cotton mote waste, bark, flume grit, etc.) a twelve (12) inch separation from the water table and the solid waste application zone shall be maintained during the actual application period. For Classes II and IV, the presence of the water table shall be determined based on interpretation of the data from a minimum of three (3) hand auger borings at least three (3) inches in diameter to a depth of two (2) feet. These holes shall be bored at the lowest point in the proposed application area and at two (2) other points in the proposed application area. The borings shall be covered and allowed to stand for twenty-four (24) hours. The water level in the borings shall be reported to the Department with the permit request.

10. The waste generator of Classes I and III shall ensure that the boundary of application shall not extend closer than the buffers outlined below. Variances may be requested and granted on a case-by-case basis upon submittal of written documentation that the variance will not cause an environmental or public health concern. (The buffer requirements for Classes II and IV are outlined in Sections E. and G. of this regulation.)

a. Fifty (50) feet of any property line. When the property borders a paved public two-lane road, the application shall not extend closer than fifty (50) feet from the center of the road;

- b. One hundred (100) feet of any residence;
 - c. Five hundred (500) feet of any school, day-care center, hospital or recreational park area;
 - d. One hundred (100) feet of any surface water body; and,
 - e. One hundred (100) feet of drinking water wells.
11. The land application of solid waste shall be conducted in a manner to:
- a. Inhibit the harborage of flies, rodents, and other vectors;
 - b. Prevent conditions for transmission of diseases to man and/or animals;
 - c. Minimize runoff, prevent water pollution and prevent the escape of the solid waste to waters of the State; and,
 - d. Minimize objectionable odors, dust, unsightliness, and aesthetically objectionable conditions, and prevent the accumulation of materials in an untidy and unsafe manner so as to become a fire, human health, environmental, and/or safety hazard.
12. Analyses of Class I, II and IV solid wastes required by this regulation for any parameter shall be analyzed by a laboratory certified for those parameters by the State Environmental Laboratory Certification Program unless otherwise noted in the regulation.
13. Solid wastes shall not be land applied when cumulative lifetime loads for heavy metals exceed the limits outlined below.

CUMULATIVE LIFETIME LOADING RATES

<u>Metal</u>	<u>lb/ac</u>	<u>kg/ha</u>
arsenic	37	41
cadmium	35	39
copper	1370	1500
lead	274	300
mercury	15	17
nickel	383	420
selenium	91	100
zinc	2550	2800

The Department may delete the requirement for any of the analyses for metals listed above if it can be demonstrated that a metal(s) is not expected to be contained in or derived from the waste to be land applied in concentrations and amounts that would cause environmental pollution or deterioration of soil quality. Likewise, the Department may require analysis of additional parameter(s) if it is demonstrated that a metal is expected to be contained in or derived from the waste to be land applied at a level that could present environmental and health problems at the proposed rate of application.

14. If other wastes are subsequently applied to the proposed location, documentation to include soil analyses performed by a Certified Laboratory shall be submitted to the Department with the annual report to show that the cumulative metal loads have not been exceeded.

15. The generator shall notify the Department prior to any changes in fuel source, process operations, or other changes that may alter the chemical characteristics of the waste.

16. The temporary storage of Class I and Class II solid wastes at the application site shall be limited to the amount designated for use at that location, and shall comply with the criteria outlined below if storage exceeds seven (7) days. (Temporary storage requirements for Class III and Class IV are outlined in Sections F. and G. respectively in this regulation.)

- a. Temporary storage at the application site shall not exceed ninety (90) days;
- b. Earthen dikes, berms or other suitable barriers shall be constructed around the perimeter of the storage area to minimize off-site movement of the waste materials;
- c. Monitoring wells around the perimeter of the storage area may be required on a case-by-case basis upon written notification from the Department based on consideration of the type of waste, the amount of solid waste to be stored, topography of the land, and the potential impact to groundwater, etc. Any analyses required shall be performed by a Certified Laboratory;
- d. Unless otherwise approved by the Department, materials to be stored for longer than thirty (30) days shall be covered with an impermeable barrier; and,
- e. Temporary storage locations shall be reclaimed within one (1) year of construction by re-establishing the original groundline, incorporating into the soil any small amounts of residual materials by disking or plowing and revegetating the area for soil stabilization.

17. Solid waste being land applied shall be spread uniformly over the entire acreage approved for receipt of the waste at the rate approved for application. This is not intended to preclude banding or other commonly accepted methods routinely used for application of materials to soil for crop and silvicultural production purposes.

18. For a solid waste not specifically addressed in this regulation, a request and application for a permit to land apply the said waste shall be submitted to the Department. For the purposes of this regulation, the Department will classify solid waste for land application into the following four (4) categories:

- a. Class I. Those solid wastes which require permitting by the Department prior to land application of that waste, e.g., wood ash, coal ash, green liquor dregs, and slaker grit.
- b. Class II. Those solid wastes which, due to lack of substantiating data needed to calculate agronomic rate or to document that the material is non-toxic to plants, require issuance of a Department Research, Development, and Demonstration Permit pursuant to R.61-107.10.
- c. Class III. Those solid wastes which require the generator to register the solid waste to be applied with the Department prior to any application, and subsequent notification to the Department prior to each application in lieu of permitting, e.g., cotton mote waste, cotton gin trash, bark, woodyard waste, flume grit.
- d. Class IV. Those solid wastes used in land reclamation and other projects when the application rate exceeds ten (10) dry tons per acre per year and scientific/technical data is submitted to document the proposed application rate will have no detrimental impact on the environment and public health, and is non-toxic to plants and wildlife normally associated with the crop ecosystem. Class IV solid wastes require permitting by the Department prior to application.

19. The Department may reclassify waste from one class to another based on sound scientific data.

D. Class I Solid Waste for Land Application (e.g., coal ash, wood ash, green liquor dregs, slaker grit.)

1. The generator of the Class I solid waste shall obtain a permit from the Department for the land application of the specific waste(s) at proposed location(s) prior to commencing land application operations.

2. A permit for land application of a Class I solid waste shall be reviewed by the Department on an annual basis.

3. A request for a Department permit for the land application of a Class I solid waste shall include, but not be limited to, the following:

a. A completed permit application on a form provided by the Department;

b. A county map(s) showing the location of the proposed application site(s);

c. A chemical analysis (representative analysis) of the waste material to be land applied. This chemical analysis shall be conducted on samples collected within the last three (3) months and include the parameters listed below. This sample shall be a representative sample of the waste material to be applied. New representative samples shall be analyzed if there are changes in fuel source, process operations, or other changes which would alter the chemical characteristics of the waste. The frequency of sampling and the number of sample analyses needed to establish a representative analysis will vary according to the uniformity and consistency of the waste. At a minimum, the determination of representative analysis shall be reassessed each year but shall be sufficiently frequent and extensive so as to comply with Section B.29 of this regulation, the definition for "representative sample and representative analysis".

(1) The following parameters shall be analyzed by a South Carolina Certified Laboratory certified for these parameters:

(a) Total alkalinity;

(b) Concentrations of the following metals:

arsenic	cadmium
copper	lead
mercury	nickel
selenium	zinc

(c) Total Kjeldahl nitrogen, nitrate-nitrogen, and ammonium-nitrogen;

(2) The following parameters shall be analyzed by an Agricultural Laboratory:

(a) Electrical conductivity of a saturated extract; and,

(b) Soluble boron, sodium, and sulfate;

d. A soil test from each proposed application site performed by an Agricultural Laboratory for agricultural purposes shall be submitted to the Department unless specifically exempted in the Department

permit. The soil sample(s) shall be representative of the field(s) to which the waste will be applied. The soil sample shall be collected subsequent to the most recent application of fertilizer, lime, and other material which would alter the soil test results but no more than six (6) months prior to submittal of the data. This analysis shall include a recommendation for lime and plant nutrients needed or appropriate for good crop or forest production purposes based on Best Management Practices (BMPs) and the parameters listed below. (BMPs are available from the State Extension Service, various governmental agencies involved in management of agricultural, silvicultural or horticultural lands, Certified Crop Advisers, registered foresters, soil scientists, and agronomists.)

- (1) pH;
- (2) Lime requirement; and,
- (3) Available phosphorus and potassium.

e. An application plan detailing:

- (1) Rates to be applied at each location, expressed on an areal application basis;
- (2) Cropping plan and proposed schedule for each application;
- (3) Application method and safeguards to limit soil loss; and,
- (4) Equipment to be used for uniform application.

4. To add additional application sites to the permit, the generator shall request a permit modification prior to application. The information listed below shall be submitted to the Department for approval. A variance of Item 4.b. and 4.c. below may be requested once a compliance history is established. Variances will be based on past compliance history, the consistency of the waste stream, the consistency of the soils, the consistency of crops, and submittal of scientific data to document that the application program will have no adverse impact on the environment and public health, and is non-toxic to plants and wildlife normally associated within the crop ecosystem.

- a. A county map(s) showing the location of each proposed application site;
- b. A soil test from each application site as outlined in Section D.3.d. above; and,
- c. An application plan as outlined in Section D.3.e. above.

5. Class I Application Rates:

a. Unless otherwise approved by the Department, application rates for Class I solid wastes shall not exceed ten (10) dry tons per acre per year on cultivated crop or forest lands or five (5) dry tons per acre per year on pasture land in which the waste is not incorporated into the soil surface layer unless otherwise limited to a lower rate by soil test recommendation, agronomic rate, or metal loading. For example, nitrogen, boron, sodium, or soluble salts content and alkalinity may limit application rate to less than ten dry tons per acre per year; and,

b. Requests for application rates exceeding the limits outlined above will be reviewed on a case- and site-specific basis. Such projects may be considered if accompanied by appropriate soil and crop monitoring

data for purposes of establishing relationships between soil physical characteristics and solid waste application rates, or relationships between long term, repeated applications and mobility or plant availability of elemental constituents of the solid waste or chemical processes in soil. Monitoring data obtained from such projects shall be assembled into a technical report and submitted to the Department. Requests for changes in application plans or locations shall be submitted in writing to the Department for review, consideration, and approval.

6. The following potential rate limiting factors shall establish the amount of waste that may be land applied. The application of waste shall not cause the soil pH to significantly fall below or rise above the range indicated. In addition, the application of waste shall not add more than the indicated amount of soluble sulfate, sodium, or boron. Nutrient limits are those recommended by the Clemson Cooperative Extension Service.

<u>FACTOR</u>	<u>CONSTITUENT</u>	<u>LIMIT</u>
pH (soil)		The application of waste shall not cause the soil pH to significantly fall below or rise above the range of 5.0 to 7.0.
Soluble Salts:		
extraction	boron	4 lbs/acre; readily soluble boron as determined by hot water
	sulfate	300 lbs/acre
	sodium	Less than 15% of base saturation of soil
Plant Nutrients:		<p>Agronomic crops - consult Circular 476, Cooperative Extension Service, Clemson University, Clemson, 1982. The recommendations for nitrogen, phosphorus, and potassium are provided with agricultural soil tests. In addition, recommendations may be obtained from the local County Extension Office, a Certified Crop Adviser, an agronomist or soil scientist, or the Faculty of Soils at Clemson University.</p> <p>Silvicultural sites - recommendation for nitrogen and other nutrients may be obtained from the Forest Resources Department at Clemson University, Area County Extension Agents for Forestry, or professional foresters with training in nutrient management.</p>
Metals		As specified in Section C.13 of this regulation.

7. Unless otherwise approved by the Department, Class I solid waste may be applied to the same location more frequently than once each year as long as the total amount applied in any 12-month period does not exceed ten (10) dry tons per acre, if one of the factors cited above relating to agronomic rate or metal loading does not otherwise limit the loading rate.

8. No less than twenty-four (24) hours prior to land application of a Class I solid waste at an approved location, the generator shall notify the Department's EQC District Office and provide the following information:

- a. The location to receive the application;
- b. An estimate of the volume of waste to be land applied during the project;
- c. The anticipated date to begin application activities; and,
- d. The anticipated duration of the application activities.

9. Monitoring Requirements for Class I Solid Waste.

a. Solid Waste. Annually, or more frequently if necessary to document the waste concentration within a tolerance of 25%, a new chemical analysis of a representative sample of the solid waste shall be submitted to the Department with the annual report. If there are substantive changes in fuel source, process operations, or other changes which would alter the chemical characteristics of the waste, additional sampling shall be required at that time. This analysis shall include the parameters listed in Section D.3.c.(1) of this regulation performed by a Certified Laboratory and those parameters listed in Section D.3.c.(2) performed by an Agricultural Laboratory.

b. Soil Analyses. Prior to a subsequent application of the solid waste, soil samples shall be analyzed by a Certified Laboratory for whichever constituent(s) or parameter(s) limited the previous application. The soil sample from pastures shall be taken from the surface 2-3 inches. Samples from cultivated fields and forested landscapes shall be taken from the surface 6 inches. If nitrogen was the limiting constituent, the soil sample shall be taken to a depth of 4 feet and divided into five subsamples (0-6, 6-12, 12-24, 24-36, and 36-48 inches) for analysis of ammonium-nitrogen and nitrate-nitrogen.

10. Reporting Requirements. Generators of Class I solid waste that is land applied shall maintain and report the information as outlined below.

a. The generator shall submit to the Department the following information in the form of an annual report for the period of July 1 through June 30. This report shall be submitted to the Department on or before August 15th and shall include:

(1) Any chemical analyses of the wastes performed during the reporting period subsequent to the original data submitted with the permit application request;

(2) Soil analyses for all locations that received an application of solid waste subsequent to the application of the amount of waste approved for the initial 12-month period, pursuant to Section D.9.b. above; and,

(3) The total amount of solid waste in tons land applied during the reporting period; and,

b. The generator shall maintain on site the following application site information and shall submit to the Department upon request:

(1) Location of the site(s) that received solid waste applications during the reporting period;

(2) Amount of solid waste applied to each site;

(3) Number of acres treated at each site;

- (4) Date of application(s) at each site; and,
- (5) The crop being grown on the application site.

E. Class II Solid Waste for Land Application.

1. The Department may issue a Research, Development, and Demonstration Permit (RD&D Permit) in accordance with Regulation 61-107.10 for the land application of Class II solid waste. RD&D Permits will be issued for the purpose of gathering soil and crop information when documentation and data are unavailable to ensure that:

- a. Land application of a particular solid waste will have no detrimental impact to the environment or public health; and,

- b. Application rates that exceed 10 tons per acre per year on cultivated or forest land and 5 tons per acre per year on pasture land will have no detrimental impact to the environment or public health.

2. Land application of Class II solid waste will be considered by the Department on a case- and site-specific basis.

3. Unless otherwise defined in the Department permit, the boundary of a Class II solid waste application shall not extend closer than:

- a. One hundred (100) feet of any property line. Variances may be requested and granted on a case-by-case basis upon submittal of written consent from the adjacent landowner(s).

- b. One hundred (100) feet of any residence;

- c. Five hundred (500) feet of any school, day-care center, hospital or recreational park area;

- d. One hundred (100) feet of any surface water body; and,

- e. One hundred (100) feet of drinking water wells.

4. Class II solid waste applications shall address the following:

- a. Relationships between soil physical characteristics and the solid waste application rates; or,

- b. Relationships between long term, repeated applications and mobility or plant availability of elemental constituents of the solid waste or chemical processes in soil.

5. Monitoring data obtained from Class II applications shall be submitted to the Department in the form of a technical report concerning the effectiveness and the environmental effect of the application. This report will be reviewed by the Department and an approved independent scientist(s) prior to determining the acceptability of the solid waste for land application and/or the proposed application rate. If the research and demonstration project is successful, the Department may classify the waste as either a Class I, Class III or a Class IV waste for the purposes of this regulation.

6. No less than seventy-two (72) hours prior to land application of a Class II solid waste at an approved

location, the generator shall call the Department's EQC District Office and provide the following information:

- a. The location to receive the application;
- b. An estimate of the volume of waste to be land applied during the project;
- c. The anticipated duration of the application activities; and,
- d. An implementation schedule.

F. Class III Solid Waste for Land Application (e.g., cotton mote waste, cotton gin trash, bark, woodyard waste, flume grit.)

1. Prior to land application of a Class III solid waste, the generator shall submit a request to the Department for registration of a specific solid waste. Registration in lieu of permitting is required for land application of Class III solid wastes. This submittal shall include a qualitative description of the waste and brief explanation of why the waste is considered to be innocuous with regard to effects on soil and water resources.

2. Registration for Class III solid waste shall be renewed with the Department every five (5) years.

3. A brief report summarizing the experiences of those who operate the land application sites as to their degree of satisfaction with the practice shall be submitted to the Department every five (5) years from the date of registration with a request for renewal of registration.

4. Land application of Class III solid wastes shall not exceed ten (10) dry tons per acre per year without written authorization from the Department.

5. The land application of all Class III solid wastes shall be in accordance with the requirements in Section C. of this regulation.

6. No less than twenty-four (24) hours prior to land application of any permitted or registered solid waste at an approved location, the generator shall call the Department's Environmental Quality Control District Office and provide the following information:

- a. The location to receive the application;
- b. An estimate of the volume of waste to be land applied during the project;
- c. The anticipated date to begin application activities; and,
- d. The anticipated duration of the application activities.

7. Temporary Storage.

a. The temporary storage of a registered Class III solid waste at the application site prior to application shall not exceed six (6) months. Appropriate measures shall be taken to prevent fires and to control mosquitoes and rodents in order to protect the public health and welfare, and to prevent public health nuisances associated with the waste being temporarily stored; and,

b. Temporary stockpile volumes shall be limited to the amount designated for use at that location.

G. Class IV Solid Waste for Land Application/Reclamation. Class IV solid wastes are those solid wastes used for land reclamation and other projects when the application rate exceeds ten (10) dry tons per acre per year and scientific/technical data is submitted to document that the proposed application rate will have no detrimental impact on the environment and public health, and is non-toxic to plants and wildlife normally associated with the crop ecosystem. Solid wastes used in land reclamation and other projects when the application rate is less than ten (10) dry tons per acre per year shall be classified as either Class I or III, as appropriate.

1. The generator of the Class IV solid waste shall obtain a permit from the Department for the land application of the specific waste(s) at proposed location(s) prior to commencing land application/reclamation operations.

2. A permit for land application of a Class IV solid waste shall be reviewed by the Department on an annual basis.

3. A request for a Department permit for the land application of a Class IV solid waste shall include, but not be limited to, the following:

- a. A completed permit application on a form provided by the Department;
- b. A 7.5 minute quadrant map (U.S. Geological Survey topographic map, including the legend and name of the quadrant) with the proposed application site(s) identified;

c. A site plan on a scale of four (4) inches per mile for each application site. This map shall at a minimum identify the following:

(1) Location of surface water bodies, dry runs, wetlands, the location of the 100-year flood plain boundaries, and other applicable details regarding the general topography of the application site and immediately adjacent properties;

(2) Land use immediately adjacent to the boundaries of the proposed site to demonstrate compliance with buffer requirements including the location of all homes, schools, hospitals, recreational park areas, drinking water wells, and roads;

- (3) Restricted or excluded areas; and,
- (4) Proposed temporary storage area(s);

d. A Chemical analysis (representative analysis) of the waste material to be land applied. This chemical analysis shall be conducted on samples collected within the last three (3) months and include the parameters listed below. This sample shall be a representative sample of the waste material to be applied. New representative samples shall be analyzed if there are changes in fuel source, process operations, or other changes that would alter the chemical characteristics of the waste. The frequency of sampling and the number of sample analyses needed to establish a representative analysis will vary according to the uniformity and consistency of the waste. At a minimum, the determination of representative analysis shall be reassessed each year but shall be sufficiently frequent and extensive so as to comply with Section B.29 of this regulation, the definition for "representative sample and representative analysis".

(1) The following parameters shall be analyzed by a South Carolina Certified Laboratory certified for these parameters:

(a) Total alkalinity;

(b) Concentrations of the following metals:

arsenic	cadmium
copper	lead
mercury	nickel
selenium	zinc

(c) Total Kjeldahl nitrogen, nitrate-nitrogen, and ammonium-nitrogen;

(2) The following parameters shall be analyzed by an Agricultural Laboratory:

(a) Electrical conductivity of a saturated extract; and,

(b) Soluble boron, sodium, and sulfate;

e. A soil test from each proposed application site performed by an Agricultural Laboratory for agricultural purposes shall be submitted to the Department unless specifically exempted in the Department permit. The soil sample(s) shall be representative of the field(s) to which the waste will be applied. The soil sample shall be collected subsequent to the most recent application of fertilizer, lime, and other material which would alter the soil test results but no more than six (6) months prior to submittal of the data. This analysis shall include a recommendation for lime and plant nutrients needed or appropriate for good crop or forest production purposes based on Best Management Practices (BMPs) and the parameters listed below. (BMPs are available from the State Extension Service, various governmental agencies involved in management of agricultural, silvicultural or horticultural lands, Certified Crop Advisers, registered foresters, soil scientists, and agronomists.)

(1) pH;

(2) Lime requirement; and,

(3) Available phosphorus and potassium.

f. An application plan detailing:

(1) Rates to be applied at each location, expressed on an areal application basis;

(2) Cropping plan and proposed schedule for each application;

(3) Application method and safeguards to limit soil loss; and,

(4) Equipment to be used for uniform application.

4. To add additional application sites to the permit, the generator shall request a permit modification prior to application. The following information shall be submitted to the Department for approval:

a. A 7.5 quadrant map as outlined in Section G.3.b. above.

b. A site plan as outlined in Section G.3.c. above.

- c. A soil test from each application site as outlined in Section G.3.e. above; and,
 - d. An application plan as outlined in Section G.3.f. above.
5. Unless otherwise defined in the Department permit, the boundary of a Class IV solid waste application shall not extend closer than:
- a. One hundred (100) feet of any property line. Variances may be requested and granted on a case-by-case basis upon submittal of written consent from the adjacent landowner(s).
 - b. One hundred (100) feet of any residence;
 - c. Five hundred (500) feet of any school, day-care center, hospital or recreational park area;
 - d. One hundred (100) feet of any surface water body; and,
 - e. One hundred (100) feet of drinking water wells.
6. Class IV application rates will be reviewed on a case- and site-specific basis. Such projects will be considered if accompanied by appropriate soil and crop monitoring for purposes of establishing relationships between soil physical characteristics and solid waste application rates, or relationships between long term, repeated applications and mobility or plant availability of elemental constituents of the solid waste or chemical processes in soil. Monitoring data obtained from Class IV projects shall be assembled into a technical report and shall be submitted to the Department at the end of the project.
7. The following potential rate limiting factors shall establish the amount of waste that may be land applied. The application of waste shall not cause the soil pH to significantly fall below or rise above the range indicated. In addition, the application of waste shall not add more than the indicated amount of soluble sulfate, sodium, or boron. Nutrient limits are those recommended by the Clemson Cooperative Extension Service.

<u>FACTOR</u>	<u>CONSTITUENT</u>	<u>LIMIT</u>
pH (soil)		The application of waste shall not cause the soil pH to significantly fall below or rise above the range of 5.0 to 7.0.
Soluble Salts:		
	boron	4 lbs/acre; readily soluble boron as determined by hot water extraction
	sulfate	300 lbs/acre
	sodium	Less than 15% of base saturation of soil
Plant Nutrients:		Agronomic crops - consult Circular 476, Cooperative Extension Service, Clemson University, Clemson, 1982. The recommendations for nitrogen, phosphorus, and potassium are provided with agricultural soil tests. In addition, recommendations may be obtained from the local County Extension Office, a Certified Crop Adviser, an agronomist or soil scientist, or the Faculty of Soils at Clemson University.

Silvicultural sites - recommendation for nitrogen and other nutrients may be obtained from the Forest Resources Department at Clemson University, Area County Extension Agents for Forestry, and professional foresters with training in nutrient management.

Metals

As specified in Section C.13 of this regulation.

8. Class IV solid waste may be applied to the same location more frequently than once each year as long as the total amount applied to any location:

- a. Does not exceed the cumulative lifetime metal loading rate;
- b. Does not exceed the annual application rate permitted by the Department; and,
- c. Is non-toxic to plants and wildlife normally associated with the crop ecosystem.

9. Requests for changes in application plans or locations shall be submitted in writing to the Department for review, consideration, and approval.

10. The generator shall ensure that the Class IV solid waste is uniformly spread over the entire acreage and incorporated into the soil, e.g., that heavy equipment is available to properly spread and incorporate the waste.

11. No less than seventy-two (72) hours prior to land application of a Class IV solid waste at an approved location, the generator shall notify the Department's EQC District Office and provide the following information:

- a. The location to receive the application;
- b. An estimate of the volume of waste to be land applied during the project;
- c. The anticipated date to begin application activities; and,
- d. The anticipated duration of the application activities.

12. The temporary storage of Class IV solid wastes at the application site shall be limited to the amount designated for use at that location, and shall comply with the criteria outlined below if storage exceeds forty-eight (48) hours.

- a. Temporary storage at the application site shall not exceed two (2) weeks;
- b. Earthen dikes, berms or other suitable barriers shall be constructed around the perimeter of the storage area to minimize off-site movement of the waste materials;
- c. Monitoring wells around the perimeter of the storage area may be required upon written notification from the Department on a case-by-case basis based on consideration of the type of waste, the amount of solid waste to be stored, topography of the land, and the potential impact to groundwater, etc. Any analyses required shall be performed by a Certified Laboratory; and,

d. Temporary storage locations shall be reclaimed within thirty (30) days of construction by re-establishing the original groundline, incorporating into the soil any small amounts of residual materials by disking or plowing and revegetating the area for soil stabilization.

13. Monitoring Requirements for Class IV Solid Waste.

a. Solid Waste. Annually, or more frequently if necessary to document the waste concentration within a tolerance of 25%, a new chemical analysis of a representative sample of the solid waste shall be submitted to the Department with the annual report. If there are substantive changes in fuel source, process operations, or other changes which would alter the chemical characteristics of the waste, additional sampling shall be required at that time. This analysis shall include the parameters listed in Section G.3.d.(1) of this regulation performed by a Certified Laboratory and those parameters listed in Section G.3.d.(2) performed by an Agricultural Laboratory.

b. Soil Analyses. Prior to a subsequent application of the solid waste, soil samples shall be analyzed by a Certified Laboratory for whichever constituent(s) or parameter(s) limited the previous application. The soil sample from pastures shall be taken from the surface 2-3 inches. Samples from cultivated fields and forested landscapes shall be taken from the surface 6 inches. If nitrogen was the limiting constituent, the soil sample shall be taken to a depth of 4 feet and divided into five subsamples (0-6, 6-12, 12-24, 24-36, and 36-48 inches) for analysis of ammonium-nitrogen and nitrate-nitrogen.

14. Reporting Requirements. Generators of Class IV solid waste that is land applied shall submit to the Department and to the landowner, an annual report for the period of July 1 through June 30. This report shall be submitted to the Department on or before August 15th and shall include the information outlined below. This information shall be maintained by the generator for a period not less than ten (10) years.

a. Any chemical analyses of the wastes performed during the reporting period subsequent to the original data submitted with the permit application request;

b. Any soil analyses performed during the reporting period subsequent to the original data submitted with the permit application request;

c. Application Site Information. The following information shall be included in the annual report:

- (1) Location of the site(s) that received solid waste applications during the reporting period;
- (2) Amount of solid waste applied to each site;
- (3) Number of acres treated at each site;
- (4) Date of application(s) at each site; and,
- (5) The crop(s) being grown on the application site(s).

H. Violations and Penalties. A violation of this regulation or any permit, order, or standard subjects the person to the issuance of a Department order or to civil enforcement action in accordance with S.C. Code Section 44-96-450. Willful violation of this regulation or any permit, order, or standard subjects the person to the issuance of a Department order or to criminal enforcement action in accordance with S.C. Code Section 44-96-450. Any person to whom an order is issued may appeal it as a contested case pursuant to R.61-72, Procedures for Contested Cases, and the S.C. Administrative Procedures Act, S.C. Code Section 1-23-310 et

seq.

I. Severability. Should any section, paragraph, sentence, clause or phrase of this regulation be declared unconstitutional or invalid for any reason, the remainder of this regulation shall not be affected thereby.